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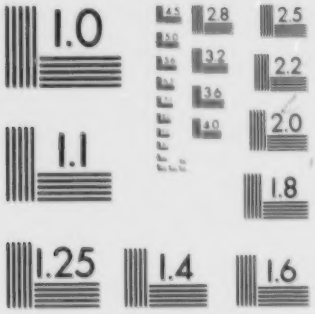

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D.A.T.E.

DEMONSTRATION OF AGRICULTURAL TECHNOLOGY AND ECONOMICS PROJECTS

Province of British Columbia
Ministry of Agriculture and Fisheries

89-01656/

1987
D.A.T.E. PROGRAM REPORT

Demonstration of Agricultural Technology and Economics

Submitted by:

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The Committee is appreciative of the work done by Laurie Duesterwald in the typing of this report.

Province of British Columbia Ministry of Agriculture and Fisheries
VICTORIA, B.C.
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TERMS OF REFERENCE

D.A.T.E. funds may be used for:

1. Evaluating and demonstrating known technological advances for enhancing the production, processing and marketing of agricultural products.

2. Supporting adaptive research projects aimed at solving priority problems confronting British Columbia agriculture.

3. Investigating production, processing and marketing systems to identify or substantiate the need for new technology.

4. Supporting mission-oriented trips with the objectives of: investigating innovative production, processing and marketing techniques for import or ultimate adaption in this Province; and/or investigating export opportunities for British Columbia agriculture and fisheries technology.

5. Importing expertise to assist in introducing new technology or to advise on critical problem situations.

1987-88 D.A.T.E. Program

The D.A.T.E. (Demonstration of Agricultural Technology and Economics) Program provides funding for British Columbia Ministry of Agriculture and Fisheries staff supervised projects.

Thirty four ongoing or new projects were reported on in 1987. Included below are highlights from a few of the areas studied.

- Three direct marketing associations were set up on Vancouver Island to assist local producers to sell their products directly to the consumers. Brochures listing the locations of the participating producers in the three marketing areas were printed. Also listed were the produce offered and its seasonal availability. The project proved to be very successful.

- A demonstration of floatation systems for use on grain swathers during wet weather and extremely soft soil conditions was carried out in the Peace River. Valuable data was collected on the two systems tested.

- Several projects addressed vegetable quality and marketability. Included in these studies were carrots, celery, lettuce and potatoes. Progress was made in identifying disease resistant varieties of celery and carrots and varieties of lettuce with longer shelf life. Work was done to develop the optimum nitrogen fertilizer program for potatoes.

- A project addressed the improvement of native stand Christmas trees. It concluded that is it possible to grow a very high quality tree in many of the native stands. This can be achieved through better tree nutrition and modified cultural practices. Studies in this area will continue.

- Fox Farming is a developing industry in central and northern British Columbia. In 1988, a Norwegian expert in the artificial insemination of foxes was brought to British Columbia under the auspices of D.A.T.E. to demonstrate this technique. A very successful clinic was held for 12 fox farmers over a ten day period.

- A high incidence of congenital deformities in the calves of beef cows led to a project which sought to link these anomalies to the feeding of red clover silage over winter. While the study is continuing, it was revealed that red clover was not the contributing factor, but instead that the silage making process itself was the cause. The addition of dry hay or grain to the diet can help to avoid this condition.

The D.A.T.E. Program Committee would like to acknowledge the co-operation of the project supervisors in the implementation of the 1987-88 D.A.T.E. program. The D.A.T.E. program continues to be a very valuable vehicle for carrying out research and demonstration projects.

ACCELERATED EDUCATION OF FARMERS

Project Number: 103

Supervision: Ron Sera

Co-operators: David Kent, Media Production Centre, Kelowna

Branches: Information Services

Funding: D.A.T.E. 1986-87 $18,000
D.A.T.E. 1987-88 $ 2,000

Objectives: To improve the quality of farmer education by acquisition, production, and distribution of agricultural educational videotapes. A total of forty-four programs were purchased, copied, or produced in support of the project. Videotapes were purchased from Alberta Agriculture, University of Saskatchewan, and Worker's Compensation. Blank videotapes were purchased from 3-M and Pacific Transfer, the former for duplication, and the latter for mastering purposes. Seventy-seven programs were copied for field office requests, and another fifty copies are anticipated before April 1st, 1988.

The distribution of videotapes is handled through the Media Library service in Kelowna. The physical cost of program and tape purchases has been covered through this D.A.T.E. funding, while the labour and shipping costs have been paid for by our Branch. The demand for these programs has increased dramatically from last year. As of the new year, videotapes had 2,810 program usage days (the number of days a tape is out and in use). Projected figures for the entire fiscal year are 4,510 program usage days. This is a 55% increase in demand from 86/87.

Evaluation sheets were included with all program loans, and although an average of only 20% were returned, the service and programs received a good or very good rating on 78% of the sheets. Our offices are the major users, but in most cases they are ordering on behalf of farmers in their area. Other major users were the Western Indian Agriculture Corporation and colleges, with the remainder of users being farmers, ranchers, or farm organizations.

Summary: The library was enhanced during the year by standardizing tape cases and computerized labels. The library loan database was modified to handle the increase in program demand.

The actual results of this year's project are difficult to gauge, except for the fact that 55% more programs are being used this year than last, and that favorable responses have been given to the quality of program material. Field staff have commented that next year more funding should be made available for program purchase for their regions/offices. The number of programs acquired next year will increase now that the Media Unit has easy access to a satellite recording facility for the numerous programs being broadcast on Westar IV from the U.S. Midwest.

THE ESTABLISHMENT AND MANAGEMENT OF A RANGELAND SEEDING

Project Number: 113

Supervision: R.M. Tegart, Field Crops and Range Specialist, Creston; M.J. Malmberg, District Agriculturist, Cranbrook

Co-operators: Skookum Ranches, Skookumchuck; Harland Bradford, JP Ranch, Skookumchuck; L.G. Brown, Engineering Technician, Kamloops; N.A. Gough, Soil Fertility Specialist, Kelowna; Bert van Dalfsen, Engineer, Abbotsford;

Branches: Okanagan-Kootenay Regional Extension Services

Funding:

D.A.T.E.	1982-83	$1,018.50
D.A.T.E.	1983-84	$6,260.00
D.A.T.E.	1984-85	$3,150.00
D.A.T.E.	1985-86	$2,500.00
D.A.T.E.	1986-87	$2,650.00
D.A.T.E.	1987-88	$2,000.00

Objectives:

1) To demonstrate the tillage and seeding requirements necessary to ensure a successful seeding via the use of our Ministry's Rangeland Seeder.

2) To demonstrate the management of a Crested Wheatgrass/ Alfalfa seeding by measuring animal performance and seeding productivity and assessing it through an economic evaluation.

3) To provide additional information on species/and variety selection fertility needs and the economics of fertilization.

Summary: 1987 saw 80 heifers and 2 bulls graze the project for a period of 67 days. Although animals could have gone out April 18, our co-operator turned out onto the Crested Wheatgrass seeding April 25. Even so, his turnout was almost three weeks earlier than that permitted on the adjacent crown range.

The 300 acre site includes 200 acres of fair condition native bluebunch wheatgrass/rough fescue grassland and a 100 acre Crested Wheatgrass seeding. The site was divided into four pastures via a combination of temporary and permanent electric fences.

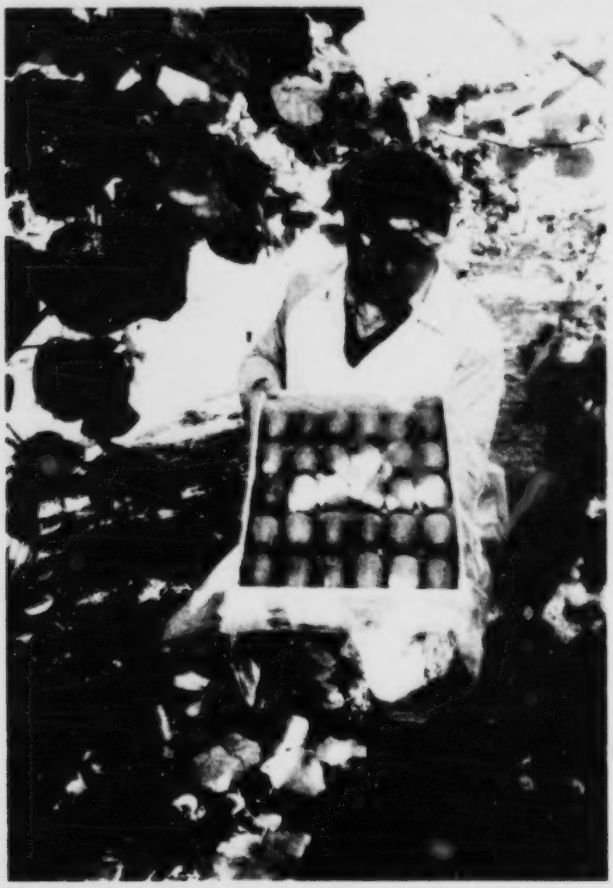
The sequence of cattle movement was:

1.	April 25	Crested Wheatgrass (north)
2.	May 17	Native Grassland (south)
3.	May 26	Native Grassland (north)
4.	June 8	Crested Wheatgrass (south)
5.	June 29	Crested Wheatgrass (north)
6.	July 1	Removed from project site

The average heifer starting weight was 850 pounds. They gained 1.5 pounds per day and averaged 950 pounds on July 1, 1988. The stocking rate on the Crested Wheatgrass seeding was 1.25 AUM/acre which produced 55 pounds of beef per acre. The native portion stocking rate was 0.3 AUM/acre (or 3.5 acre per AUM) which produced 14 pounds of beef per acre.

The project went very well even though 1987 was a dry year. The site's productivity and the cattle performance pleased everyone involved. A very successful tour of the project site was held in June.

DEMONSTRATION KIWIFRUIT PLANTINGS IN SOUTH COASTAL B.C.



Ronny Quay, Agriculture Canada Technician, Displaying a tray of B.C. grown kiwifruit.

Project Number: 181

Supervision: B. Warner, Horticulturist, Sidney

Co-operators: Agriculture Canada (New Crop Development Fund), Ian Vantreight, George Doney, Harm Wernicke, (co-operating farmers); Doug O'Brien, Technician; Rod Chilton, contract employee; Ronny Quay and Jim Alsbury, Ag. Canada

Branches: Regional Extension Services, South Coastal

Funding:

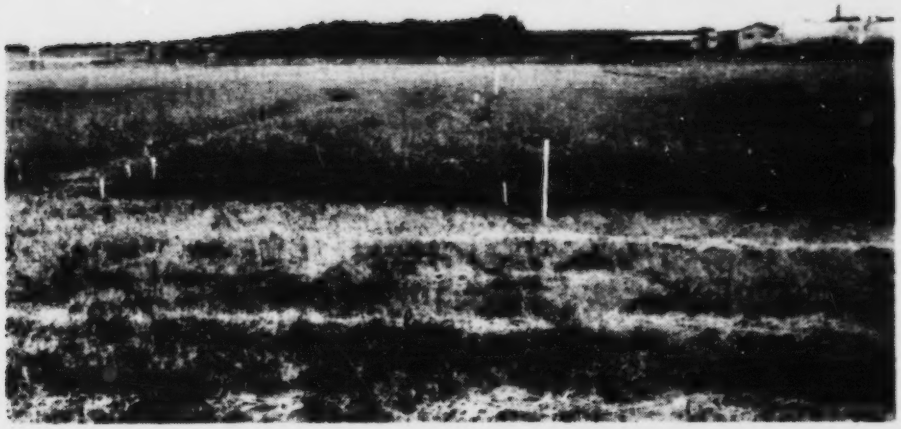
D.A.T.E.	1984-85	$21,300
D.A.T.E.	1985-86	-
D.A.T.E.	1986-87	$11,500
D.A.T.E.	1987-88	$ 2,000

Summary:

1987 was the year of the first commercial kiwifruit harvest in British Columbia. Over 23 tons of fruit was harvested on Vancouver Island and approximately one ton on the mainland. All the fruit on the Island was graded and packed by the B.C. Kiwifruit Growers Association at Vantreight farms. Approximately 4,000 trays and 7,000 lbs of bulk pack fruit was marketed into the Victoria market. Initial response from wholesalers and consumers has been extremely positive. Returns to farmers from early sales have averaged forty cents (40¢) per fruit.

The initial trays utilized by the B.C.K.G.A. were waxed cardboard fabricated by Crown Paper. Problems have developed with the strength of these boxes and it is likely that they will be replaced with wood in 1988.

EFFECT OF MATURITY OF FORAGE QUALITY AND QUANTITY



Timothy Harvest on the Experimental Farm

Project Number: 193

Supervision: Garth Elgie, former District Agriculturist, Prince George
Jim Tingle, Forage Specialist, Prince George

Co-operators: Ken Watson, hay grower; Francis Zingle, beef grower; Ed Woolrich, beef grower; Les Brown, hay/beef grower; Harold Giesbrecht, dairyman; Klass Broersma, Ag. Canada

Branches: Regional Extension Services, North Central Region
Field Crops Branch, North Central Region

Funding: D.A.T.E. 1985-86 $10,200
D.A.T.E. 1986-87 $ 9,000
D.A.T.E. 1987-88 $ 3,000
Agriculture Canada $ 500 per year

Objectives: To determine the change in forage quality and quantity on a weekly basis over the growing season and to correlate these changes to environmental factors and the growth patterns of the forage.

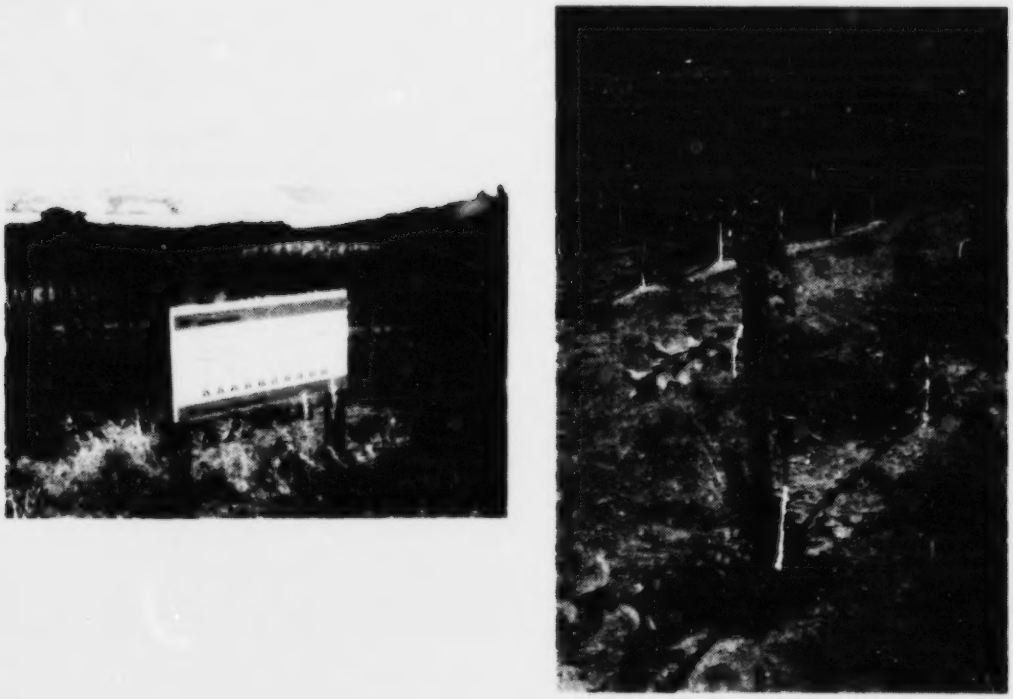
Summary: Dr. Ralph McQueen, Agriculture Canada, Fredericton, initiated a hay forecast (quality and yield changes on a weekly basis) in Atlantic Canada. A model has been developed from this data to predict optimum cutting time for hay based on forage species and environmental factors. It would be desirable to have a similar model for Central B.C.

The three-year project has been completed. Five forage mixtures and up to 8 varieties of legumes and grasses were clipped weekly for 10 weeks during the growing season. Clippings were measured for yields and quality. Crude protein and digestibility were analyzed in the Agriculture Canada Experimental Farm laboratory.

Results of analyses were released to the media within five days of clipping. The farming community was able to utilize the information to make harvesting decisions. Some producers have now initiated their hay harvest by mid-June to produce a top quality hay.

Dr. Steve Mason, Provincial Nutritionist, used the data from this study to write the factsheet, "The Value of Forage Quality".

INTENSIVE APPLE PLANTING DEMONSTRATION PROJECT



Trees Trained to the Slender Spindle System

Project Number: 200

Supervision: M. Sanders, Provincial Tree Fruit Specialist, Kelowna
Dr. H. Quamme, Pomologist, Agriculture Canada, Summerland
N. Filipenko, Naramata Co-operative, Naramata

Co-operator: Ted Ritchie, Orchardist, Naramata

Branches: Regional Extension Service, Okanagan-Kootenay, Economics Branch

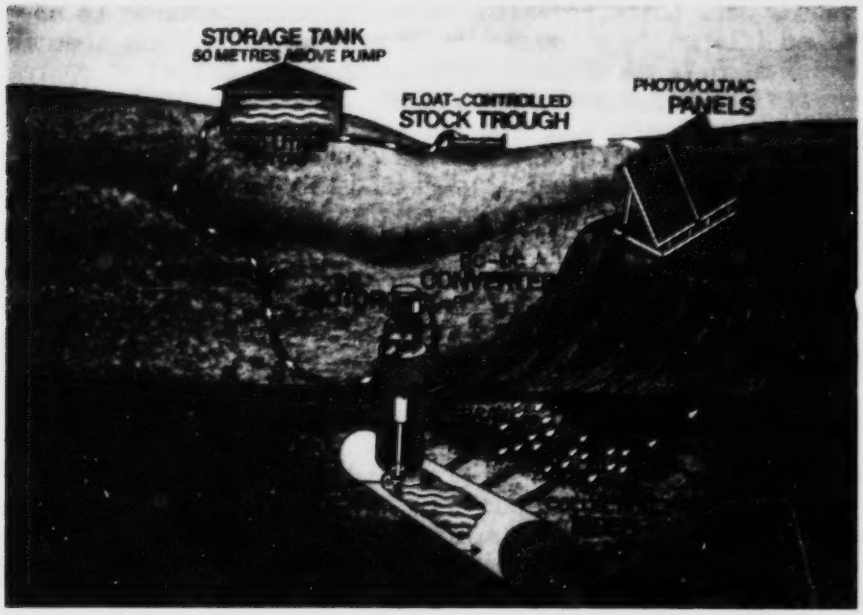
Funding: D.A.T.E. 1987-88 $5,293
New Crop Development Fund 1987-88 $7,059
Mr. Ted Ritchie 1987-88 $5,293

Objectives: To demonstrate four apple training systems in a commercial orchard using McIntosh, a commercial cultivar. The systems chosen are U.S.D.A. Central Leader, Van Roechoudt Trellis, Central Axe, and Slender Spindle. Rootstocks are M 9 and M 26.

An annual economic analysis will be prepared by George Geldart, B.C.M.A.F., showing total costs and returns for each combination under trial.

Summary: The trees were planted in spring of 1987 and appropriate support systems were installed. Trees showed good growth through the season and tree training techniques were utilized. A small crop is expected in 1988 and higher yields will be obtained in 1989, and subsequent years. Complete records detailing costs and timing of operations have been documented.

RENEWABLE ENERGY USE IN RANGE WATER PUMPING



Schematic layout of photovoltaic powered stock water pumping system

Project Number: 210

Supervision: Lance Brown, A.Sc.T., Agricultural Engineering Technologist, Kamloops

Co-operators: Energy Mines and Resources Canada, Conservation and Renewable Energy Office, Vancouver
John Schalles, Schalles Ranch, Ashcroft
Peter Ward, Ward and Associates, Vancouver

Branches: Engineering
Information Services, Media Production Centre, Kelowna

Funding: D.A.T.E. 1986-87 $7,675 (Implementation)
EMR., Canada 1986-87 $24,775 (Implementation, Monitoring Information Transfer)

Objective: To demonstrate the suitability of renewable energy in pumping livestock water on rangeland using photovoltaic technology.

Summary:

In August, 1986 a photovoltaic (P.V.) powered water pumping system was installed on a range demonstration site near Cache Creek, B.C. (see D.A.T.E. No. 190). The original design criteria was to pump 3800 litres (the average daily water requirement of 100 cows) up a lift of 55 metres. The design lift was lowered to 43 metres when detailed monitoring indicated a lower than rated P.V. panel power output. For the period of operation in 1986, August to November, an average 3667 litres per day was pumped up the lift of 43 metres. With initial charging of the storage system prior to grazing, this was sufficient to meet the requirements.

In 1987, the P.V. array of 10 panels was replaced on warranty. The new panels had a 10% increase in power output which resulted in a 15% increase in overall system efficiency. Detailed system performance monitoring by Ward and Associates was carried out for a six week period in April and May. The pumping was continuous from 8 April to 30 October with the following results:

Spring pumping:	Average	4567 litres per day
Summer pumping:	Average	5844 litres per day
Fall pumping:	Average	5724 litres per day
Full Season Average:		5528 litres per day

The lift for the entire period was 43 metres.

The reliability of the system was excellent. The only equipment problems were with a prototype controller which, when replaced with a printed circuit production mode in May, performed well for the rest of the season. The P.V. system is self starting and stopping requiring no daily attention, a desirable feature for range water pumping.

Due to changing grazing patterns, the water could not be used by cattle. The lift was simulated by pumping through a pressure sustaining valve with the water recirculated to the spring sump. As the data collection is now complete, modification to the pumping system will be carried out in 1988 to allow pumped water to be used in spring and/or fall grazing periods.

A P.V. powered pumping system of 15 to 20 metres lift would now be competitive with existing alternatives. Until the costs of the P.V. panes is reduced (which the P.V. industry expects within 5 years) small power systems will be the most attractive. These will be in the range of 80 to 160 watts compared with the 400 watt system of this project. Such a system will be installed on private land in 1988 as a result of this demonstration. Others can be expected as this new technology becomes accepted.

A film produced by the B.C.M.A.F. Media Production Centre in Kelowna is completed and will be used in producer workshops in 1988. A video copy is also available for use on the Ministry's loan out program.

The installation of the project was filmed and is now available on video through the Ministry's media centre in Kelowna.

SUPPLEMENTAL IRRIGATION IN A SHORT SEASON AREA

Harvesting Irrigated Cereal Silage

Project Number: 211

Supervision: J.N. Tingle, Forage Specialist, Prince George

Co-operators: Jean and Doug Hawley, hay growers;
Ted van der Gulik, Irrigation Specialist, Abbotsford;
Steve Lamble, Climatologist, Ministry of Environment

Branches: Field and Special Crops
Engineering

Funding: D.A.T.E. 1987-88 $7,475

Objectives: To measure improvements in crop yield and feed quality due to irrigation under recommended management practices in a short season area.

Summary: A test site was selected on the farm of Jean and Doug Hawley at Priestly, near Burns Lake in May, 1986. One acre each of dryland and irrigated land was plowed and prepared for seeding various crop trials including cereal silage, cereal grain, fall pasture and alfalfa varieties.

On an additional four acres each of dry and irrigated hayland recommended fertilizer rate was compared to the Hawley's normal fertilizer rate. The 1986 production from one cut of hay was as follows:

Hay Production in Tons per Acre

	Producer's Fertilizer Rate -1986 (53N-10P_2O_5-10K_2O-7S) -1987 (60N-32P_2O_5-20K_2O-28S)		Recommended Fertilizer Rate (60N-32P_2O_5-20K_2O-28S) (94N-32P_2O_5-20K_2O-28S)	
	1986	1987	1986	1987
Dryland	1.92	1.28	2.92	1.46
Irrigated Land	3.32	1.79	4.62	3.55

In 1987, a dry year, extra nitrogen above the recommended 50 to 60 lbs. actual N/acre did not produce sufficient hay to pay for the added nitrogen. On the irrigated land an extra 34 lbs. of nitrogen/acre above the dryland recommendation produced an extra $110 worth of hay above added fertilizer rates.

Highlights of these studies include:
- yield increases due to irrigation of 1.0 to 1.9 tons of hay; 3.0 to 6.0 tons of barley silage and 26 bushels of grain per acre;
-a high grain yield from the new early barley variety Jackson;
-the certainty of perennial forage establishment under irrigation;
-the excellent fall growth of Aubade and Lirasand annual ryegrass under irrigation;
-the need for higher fertilizer rates to obtain the full potential of irrigation in this one-cut area.

The trials will be continued in 1988.

TESTING A NEW DEVICE FOR HONEYBEE QUEEN REARING
- "THE JENTER QUEEN REARING COMB"

Project Number: 215

Supervision: N.J. Gates, Apiculture Technician
Apiary Program, Vernon

Co-operators: D. Lomond, Project Employee; F. Taylor, Landowner
B.C. Honey Producers' Association

Branches: Field and Special Crops

Funding: D.A.T.E. 1986-87 $4,925
B.C.H.P.A. 1986-87 $500
D.A.T.E. 1987-88 $ 700

Objectives:

1. To determine if the Jenter Comb can be used by beekeepers inexperienced in queen honeybee production to produce good quality honeybee queens.

2. To compare the Jenter Comb system to the traditional grafting system used to rear queen honeybees for:
   (a) labour time required per queen cell produced.
   (b) acceptance rate of queen cells by cell starting colonies.
   (c) quality of queens produced.

3. To test the durability and ease of maintenance of the Jenter Comb system.

Summary:

1. The grafting method for honeybee larvae transfer resulted in the production of 3% more virgin queens than the Jenter method.

2. The Jenter comb is easy to use and should allow any beekeeper to rear queens whereas the grafting method is an exacting process suitable only for some individuals.

3. Jenter reared virgin queens produced by the egg transfer method are slightly heavier than virgin queens produced from grafted larvae less than 24 hours old. Other research has indicated that heavier queens are more productive.

4. Jenter produced queens and graft produced queens both survived past the end of the two-season test period indicating that both types of queens were well reared and suitable for commercial use.

5. Although production of queens from eggs using the Jenter method is substantially more successful than the production of queens from eggs transferred by grafting, the success rate of egg transfer that we achieved (41%) is still too low to be acceptable for commercial production of queens. Our larvae transfer success rate (85%) that we experienced over the duration of the test indicated that this is still the method to use for commercial mass production of honeybee queens.

6. Because the Jenter system is more labour intensive than the grafting method, it is most suitable for use by beekeepers who cannot master the grafting technique or who wish to employ unskilled help to produce queens.

7. Individual cell plugs and cups used in the Jenter system are easily cleaned and reused and are relatively durable, however, the tabs used to attach the back plate to the comb are a weak point in the system. With only moderate and careful use one tab failed. The failure of one more would render the device useless.

The Jenter comb is a useful device which, if adopted, should result in an increase in queen rearing by beekeepers in B.C. and a decrease in dependence on imported queens. The Jenter Comb makes possible the transfer of extremely young larvae and allows the queen producer to accurately judge the age of larvae. As a result, queens produced by the Jenter system and by an inexperienced beekeeper should be of comparable quality to the best queens produced by the grafting method if all other steps in the queen rearing process are carried out properly. Queens produced from eggs using the Jenter system may be of slightly higher quality than queens produced from grafted larvae.

CONTROLLING INSECT HARASSMENT OF CATTLE ON PASTURE USING SELF-TREATMENT OILERS

Filling Oilers

Project Number:	223
Supervision:	J.R. Green, Livestock Agrologist, Fort St. John
Co-operators:	Beatton-Doig Livestock Association
Branches:	Regional Extension, Central/Peace River
Funding:	D.A.T.E. 1986/87 $2,200 Beatton-Doig Association 1986/87 $1,000 (Labour) D.A.T.E. 1987-88 $600
Objectives:	To determine the most effective type of self-treatment station using Pest-Doom Cattle Oilers and Ciovap insecticide for controlling insect harassment of cattle on pasture.

Summary:

The effectiveness of Pest-Doom Oilers filled with Ciovap insecticide as a low-cost insect control method for cattle on pasture was demonstrated at Umbach Pasture in 1985. A fence surrounding a dugout, complete with two self-treatment gates (so cattle were forced to go through the oiler in order to drink) worked well.

It was observed, however, that the cattle entered the gates without actually drinking. It was decided to compare the effectiveness of forced-use oilers (fenced dugout) to volunteer type oilers located at random. An additional salting enclosure was used an as alternative to the dugout enclosure.

The project has been carried out at Beaton-Doig Community Pasture during June, July and August when mosquitoes, horn flies, manure flies and horseflies cause problems. The three different types of cattle oiler stations were built in separate areas:

1. Dugout Station - a one-hectare fenced (50 x 50 meter) area surrounding a dugout with two oiler gates installed.

2. Salting Station - a fenced 15 x 15 meter area complete with two oiler gates.

3. Four oiler gates were built within a third pasture.

During 1986, the forced-use oilers were used much more often than the volunteer-type oiler gates. The salt station was the most effective.

The project was continued in 1987 with more emphasis on determination of insect populations.

Insect populations were monitored on a monthly basis to compare harassment of cattle accessing forced-use oilers to those with no protection. In almost every case there were at least twice as many insects on the cattle not accessing the oilers.

The volunteer-type oilers did not appear to reduce insect populations on the cattle. This was expected since the cattle accessing these only used 2 ml of insecticide each day as compared to 11 ml/day for the Dugout Oilers and 15 ml/day for the Salt Station Oilers.

HIGH TENSILE SMOOTH WIRE FENCE

Tightening High Tensile Smooth Wire

Project Number:	224
Supervision:	J.R. Green, Livestock Agrologist, Fort St. John
Co-operators:	Bear Mountain Livestock Association Kathy Sandy, Livestock D.A., Dawson Creek
Branches:	Regional Extension Service, Central/Peace River
Funding:	D.A.T.E. 1986-87 $2,000 1987-88 Nil
Objectives:	To demonstrate the use of high-tensile wire fencing using all available types of strainer assemblies, fasteners, droppers, and related current technology.

Summary:

The benefits of high-tensile smooth wire fencing have been well established in the Southern part of the province; however, it is still considered new technology in the Peace. Two seminars were held in 1985 on smooth wire fencing at which time many possible advantages were pointed out including longevity, cost and maintenance. Many enquiries have been made to the local BCMAF offices requesting information on this type of fence.

Fencing of a 700 x 700 meter forage management nursery seeded at Bear Mountain Community Pasture in 1985 was an ideal opportunity to demonstrate the different techniques available.

The fence was built during September/October 1986 using currently recommended techniques and as many different types of droppers, connectors, knots and strainer designs as were available.

The site is easily accessible for anyone wishing to see the "state of the art" in high tensile smooth wire fencing.

A field tour was held July 29, 1987, to demonstrate the materials/techniques used. Approximately 25 producers attended.

OSOYOOS WESTBENCH EFFLUENT IRRIGATION PROJECT

Joe Fitzpatrick measures McIntosh yields

Project Number: 229

Supervision: C.H. Brownlee, Assistant Director, Soils Branch, Kelowna; Dr. D.S. Stevenson, Head, Soil Science & Agricultural Engineering Section, Agriculture Canada Research Station, Summerland

Co-operators: Town of Osoyoos; J.J. Fitzpatrick, Project Employee; P. Gabelman, Orchardist, Osoyoos; T.R. Underwood, P. Eng., Kamloops

Branch: Soils

Funding: D.A.T.E. 1986-87 $24,000
D.A.T.E. 1987-88 $23,000
Town of Osoyoos 1986-88 $4,000

Objectives: To demonstrate the suitability of secondary municipal effluent as a source of irrigation water for the commercial production of tree fruits and grapes.

Summary: Experiments continued on blocks of McIntosh and Red Delicious apple, peach and cherry trees and Okanagan Riesling vines planted in 1983 near the Osoyoos treatment facility. The plots are irrigated with fresh water or effluent and fertilized at three nitrogen rates.

Yields, vegetative growth, tissue nutrient concentrations, plant vigour, fruit quality, soil salinity and water quality were monitored. Yield data for the 1987 crop is tabulated below. The apple trees and grape vines responded well to effluent irrigation, but results for the peaches and cherries were less pronounced.

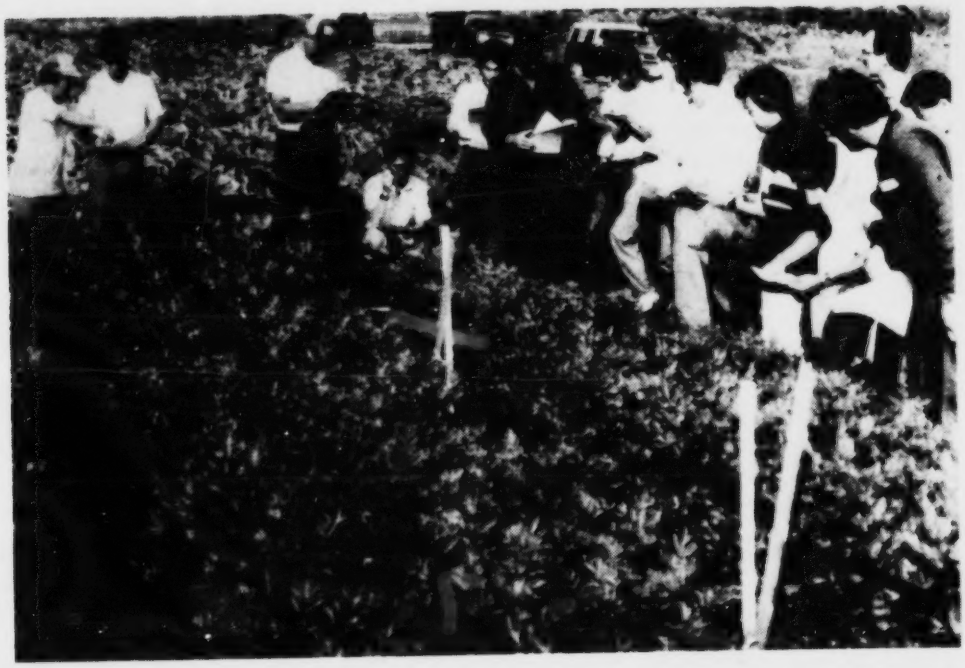
Yield, growth and nutrient concentration differences between the two waters are attributed mainly to the higher N, P and K content of the effluent. Elevated levels of these nutrients are common in municipal effluents. In other areas, however, there have been problems associated with salinity, salt and nutrient imbalances, changes in soil pH, over-fertilizing, and boron and chloride toxicities, but so far such changes from the Osoyoos effluent have been small and harmless.

This project will benefit the agriculture industry by helping to reduce apprehensions that farmers, consumers and governments decision makers may have about the use of sewage effluent to irrigate crops for direct consumption, and by identifying potential problems. When published, the results of these experiments will be useful to scientists, farmers and community planners who are considering options for sources of irrigation water, or for disposing of effluent on land.

1987 CROP YIELDS (kg/plot)

		Low N	Medium N	High N
McIntosh	Wellwater	63	61	72
	Effluent	69	79	78
Red Delicious	Wellwater	24	31	28
	Effluent	28	32	33
Peaches	Wellwater	45	39	52
	Effluent	35	41	38
Grapes	Wellwater	3.9	11.4	11.5
	Effluent	12.1	15.4	17.1

CAUSE AND CONTROL OF CELERY YELLOWS



Cloverdale celery growers viewing the 1987 Fusarium Yellows trials

Project Number: 230

Supervision: David J. Ormrod, Plant Pathologist, Surrey, B.C.

Project Staff: Irene Wilkin, Project employee with the Cloverdale Lettuce and Vegetable Co-Op

Branch: Crop Protection

Funding:
D.A.T.E. 1986-87 $4,000
Crop Protection Branch 1986-87 $1,500
D.A.T.E. 1987-88 $4,000
Crop Protection Branch 1987-88 $500
Cloverdale Lettuce and Vegetable Co-Op 1987-88 $5,000
Cloverdale Onion Research 1987-88 $844

Objectives:

1. To survey the 1987 celery crop to determine the distribution of the disorder which was identified as Fusarium Yellows caused by the soil-borne fungus Fusarium oxysporum f.sp. apii in 1986.

2. To evaluate cultural and chemical methods of disease control in a heavily infested celery field.

3. To compare a wide range of promising cultivars in an infested and in a relatively disease-free field.

Summary:

1. In 1986, 11 out of 18 farms surveyed were infested with the pathogen to some degree. In 1987, the disease was found on 14 of 20 farms surveyed. Crop loss was not severe in 1987 as 75% of the growers switched to resistant cultivars following the recommendations made after the 1986 work.

Further laboratory work is required to identify the race or races of the pathogen present in Cloverdale as it has a bearing on the usefulness of control measures used in other areas.

2. Preplant soil treatment with Vapam failed to reduce vascular discolouration in the following celery crop but did increase yield dramatically. This suggests that other biotic factors besides Fusarium may be causing yield reduction. Planting on extra high beds did not reduce disease incidence in either a susceptible or a resistant cultivar grown in infested soil. Combinations of lime, nitrogen source, and potassium source showed a very slight reduction in disease with: calcium nitrate compared to ammonium sulphate; potassium chloride compared to potassium sulphate; and limed compared to non-limed. These differences were not great enough to offer a useful measure of disease control.

3. At the heavily infested site; Pilgrim, FM 1218, Tendercrisp, 52-70HK, Bishop, and Deacon gave the highest marketable yields with the least evidence of Fusarium damage. Green Giant, 52-70R, Napoleon, Ventura and Companion bolted badly and yielded very poorly although Napoleon exhibited less bolting and Fusarium discoloration than the others.

At the relatively disease-free site; Pilgrim, Florida 683 K, Bishop and Deacon performed best although all cultivars produced acceptable yields. At both sites, Companion was the lowest yielder. Also, at both sites, FM 1218 had by far the most pronounced ribs. Summit had the lowest incidence of stalk lesions in both plots but did not yield well.

These results will enable the Cloverdale area growers to select cultivars which will produce adequate crops while work continues in the search for additional control measures.

EFFECT OF EXCLUSIVE RED CLOVER SILAGE FEEDING - OVER WINTER ON CONGENITAL DEFORMITIES IN BEEF COWS

Anomaly Calf

Project Number: 233

Supervisor: Robert Kohlert, Regional Director, North Central Region, Prince George

Co-operators: Two Ranchers, the Federal Experimental Stations at Kamloops and Prince George and the Western Veterinary College at Saskatoon

Branches: Regional Extension Services, North Central Region
Field Crops Branch, North Central Region

Funding: D.A.T.E. 1987-88 $8,500

Objectives: To determine if a winter feeding ration made up largely of red clover silage is a factor in the development of congenital deformities in pregnant beef cows.

Summary:

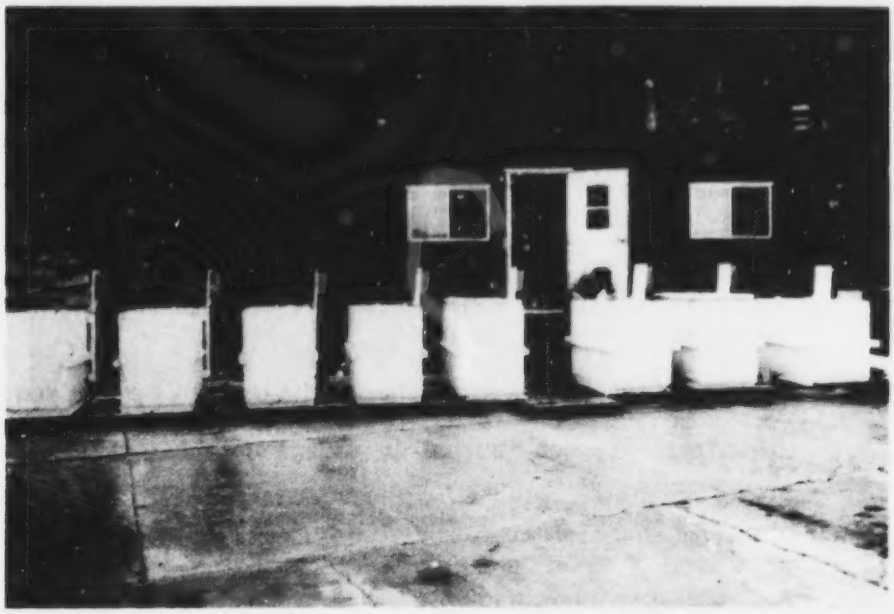
The project involved the close recording and monitoring of two beef herds fed rations that contained various levels of red clover silage. The analysis of the rations and the calves resulting was conducted under the direction of Dr. Carl Ribble of the Western Veterinary College and scientists from Agriculture Canada.

The analysis indicated that Red Clover was not the contributing factor but that the silage making process itself seemed to be the cause. At some stage during the curing process, certain imbalances or conditions exist that coupled with stressful situations in cows, such as low nutrition or cold, anomaly development in a percentage of calves will result. The exact cause has not been determined, but now that this work has been done Agriculture Canada will pursue with further research.

It was determined that the condition can be avoided by the addition of dry hay or grain to the diet, so the animals are not fed solely silage as their total diet.

These results will be reflected in the Ministry's recommendation to farmers who use silage as their main source of feeding to pregnant beef cows.

DEVELOPMENT OF GUIDELINES FOR REMOTE SETTING OF HATCHERY REARED OYSTER LARVAE



Remote setting facilities at Bamberton showing lab trailer and 8 tanks used to demonstrate affects of differing practices on larvael oyster setting success.

Project Number: 234

Supervision: W.G. Roland, Shellfish Production Specialist, Victoria

Branches: Aquaculture and Commercial Fisheries

Funding: D.A.T.E. 1987-88 $1,200

Objectives: Develop scientifically sound, practical guidelines for setting of hatchery-reared oyster larvae in tanks at farm sites (termed remote setting). This technique is used by over 40 oyster farms but methodology is not standardized and most growers have limited success obtaining seed oysters with this technique.

Summary: Experimental investigations began in mid June, 1987. Ten oyster sets were done employing 6 - 8 tanks per set. As a summary, the investigations involved the factors:

1. Conditioning: soaking cultch (material on which larvae set) in seawater various lengths of time to develop a microbial film to attract larvae.

2. Setting temperature: reported to have a major influence on proportion of added larvae setting.

3. Larvae acclamation: various ways of warming larvae from the cool shipping container prior to adding larvae to tank with the aim of increasing the proportion of setting larvae.

4. Aeration rates and patterns: to give an even distribution of larvae to reduce competition mortality and a good setting proportion with air-generated currents in tanks.

5. Flipping cultch modules: adding half of larvae one day, flipping the modules on day 2 and then adding the remainder to give an even distribution around the PVC tubes used as cultch.

6. Waxing the tank bottom to prevent setting thereon and increase the set on the tubes.

7. Feeding larvae: to study the effect on proportion setting.

8. Feeding spat (set larvae) to grow them to a larger size and hopefully increase growout survival since in general survival is better for larger oysters.

Some obvious, but untested, conclusions from the data were that aeration patterns, rates, and module flipping are critical to obtaining an even spat distribution on tube cultch. Feeding appears to have a positive influence on proportion of larvae setting, but the effects various of temperatures tested and conditioning times do not appear to be significant.

Proper data analyses will be completed by spring and new guidelines for obtaining a good set and distribution on cultch disemminated to the shellfish culture industry. Summer 1988 work will focus on means of attaining better survival of newly set seed in the natural environment.

APPLE REPLANT - SOIL TESTING AND FIELD TRIALS

Good tree growth with preplant treatments vs poor growth when no preplant treatment is used

Project Number: 235

Supervision: John M. Yorston, Plant Pathologist, Kelowna

Project Staff: Denise Kitson

Co-operators: Dr. John Slykhuis, Apple Replant Testing Service, Summerland; Dr. Gerry Nielsen, Agriculture Canada, Summerland

Branch: Crop Protection Branch

Funding: D.A.T.E. 1987-88 $14,000

Objectives: To continue evaluation of apple replant field trials established in 1986 and 1987 and to test the potential of organic matter soil ammendments for overcoming apple replant disease.

Summary:

Poor growth of newly planted apple trees in old orchard land is a major economic problem for Okanagan orchardists. Losses due to delay in fruit production over a nine year period have been estimated at $1,900 per acre. Over the next five years it is estimated that 6,000 acres will be replanted. If poor growth of young trees can be overcome by preplant soil treatments the potential economic gain is $11,400,000 spread over nine years. This goal will be very difficult to achieve but this project is a good beginning.

Part of this project assisted Dr. John Slykhuis in the operation of a private testing service where he grows apple seedlings in orchard soil treated with different materials. Results of this test show the grower which treatments are most likely to overcome replant disease on his property. In 1987, 111 samples were tested.

Greenhouse pot tests were carried out with materials such as peat, sawdust, manure, milfoil and green manure. Various combinations of these materials with 11-55-0 fertilizer and soil were tested with many different results. Generally, peat in combination with 11-55-0 fertilizer and soil has been effective. This combination has helped in clay, very course and high pH soils which often respond poorly to preplant chemical treatments. Results with manure are variable because one manure is so different from another. Green manures were not very effective in pot tests.

Growth measurements were taken from field trials established in commercial orchards in 1986 and 1987. Various chemical and fertilizer preplant treatments were used to improve growth of young trees. Greenhouse pot tests were first carried out to try the treatments. Results were variable but in most cases the best treatments in the greenhouse tests were the best in the orchard.

Generally, tree growth is improved when 11-55-0 fertilizer is used in the planting hole. When fumigants such as Basamid, Telone C-17 or Formaldehyde are used in the autumn and 11-55-0 fertilizer is used when planting the following spring, growth is nearly always better than when no treatment is used. In 1988 some of the trials will begin to bear fruit. It is expected that there will be higher yields in the treatments with the best tree growth.

With a major shift to high density planting of new orchards it is critical that trees have good early growth. The results of this project clearly indicate that preplant treatments are needed to obtain early growth and early yields.

IMPROVEMENT OF NATIVE STAND CHRISTMAS TREE PRODUCTION

East Kootenay Native Stand Christmas Tree

Project Number: 236

Supervisor: Richard Hallman, District Horticulturist, Creston

Co-operators: Kootenay Christmas Tree Association; Dave Kent, Media Production Centre, Kelowna; George Geldart, Regional Economist, Vernon; Mike Malmberg, R.E.S., Cranbrook; Carol Barnett, Provincial Nursery Specialist, Abbotsford; Rick Fornier, Faculty of Forestry, U.B.C.

Funding: D.A.T.E. 1987-88 $6,885

Objectives:
1. To demonstrate methods to improve the rate of growth, stocking rates, and quality of native grown Douglas-fir Christmas trees.
2. To develop a production cost model to evaluate the profitability and financial implications of cultural practices of native grown Christmas trees.

3. To develop audio-visual teaching aids for use in extension programs on native Christmas tree production throughout the province.

Summary:

The native stand Christmas tree industry in British Columbia is heavily concentrated in the East Kootenay area. There has been a decline in production since the 1960's to the current annual cut of 500,000 trees. These trees are shipped all over the continent and are renowned for their keeping quality. In the early 1960's, 95% of commercial Christmas trees sold in North America were grown in native stands. Today 95% of the 35 million tree crop are produced in plantations.

Serious over production on plantations is driving prices down and quality up. A majority of the native stand trees from the East Kootenay cannot compete with plantation quality. However, with a production cost of 20 - 25% of plantation trees, they can compete aggressively in that area. The primary problem is, if prices drop to where quality plantation trees are considered cheap by consumers, inferior quality native stand trees will not sell at any price.

It is possible to grow a very high quality (close to or identical to plantation group) tree in many of the native stands currently producing low quality trees. This can be achieved through better tree nutrition and a modification of cultural practices. This will result in a small increase in production costs and a significant jump in the profit margin. Through this project, equipment and techniques that will increase the quantity and quality of trees being produced, are being demonstrated. Five fertilizer and pruning demonstration sites have been established. A major field day was held in September 1987 at one of these sites in Brisco. During that field day a variety of pruning and shearing techniques and the associated equipment was demonstrated. A series of spring and fall field days are planned at each demonstration site.

The W.S.U. Extension Agent who has worked with native stands on the Olympic Peninsula for the last 10 years is being brought to the East Kootenay to conduct a series of workshops in the first week of April 1988. Slides and video tape footage have been taken as raw material for audio visual teaching aids about methods to improve the quantity and quality of trees produced. It is hoped the first of these will be available for the fall of 1988. A start has also been made on the development of a computer cost production model. The first version of this model is projected to be ready for the fall of 1988.

GRAPE VARIETY EVALUATION ON VANCOUVER ISLAND

Brent Warner & John Vielvoye, BCMAF with fresh market grape varieties prior to shipment to market

Project Number: 237

Supervision: John Vielvoye, Provincial Grape Specialist, Kelowna
Brent Warner, Horticulturist, Sidney

Co-operators: Doug O'Brien, Technician, Sidney; Peter Fofonoff, District Agriculturist, Duncan; Bernie Brosseau, Technician, Kelowna; Dr. Gray Strachan, Agriculture Canada, Summerland; Rod Chilton, Contract Technician, Sidney; Denis Zanatta, Land Owner, Duncan; Ministry of Environment, Climatology

Branches: Regional Extension Services, Okanagan, Kootenay & South Coast

Funding:

D.A.T.E.	1984-85	$3,500
D.A.T.E.	1985-86	$2,000
D.A.T.E.	1986-87	$2,000
D.A.T.E.	1987-88	$2,000

Objectives: To determine the suitability of the Duncan area of Vancouver Island to grape production.

Summary: Work continued on this planting, first established in 1983.

Seventeen of the original varieties were removed, due either to poor performance of the vine or poor quality of the fruit. 22 new varieties propogated and grown at Summerland by Mr. Vielvoye, were used as replacements.

20 cases (16 lbs) of fresh market grapes were test marketed through a local major direct marketing outlet. The varieties marketed were Interlaken and Sovereign Charter. Overall consumer acceptance was excellent with the white grapes (Interlaken) vastly out selling the Sovereign Charter.

Wine varieties are stemmed and crushed at the site. The must is transported to Agriculture Canada, Summerland, where wine is made for evaluation.

Yield and Chemical Analysis
of the 1987 Grape Crop - Duncan

Variety	Harvest Date	No. Vines in Prod.	Average Yield per vine (lbs)	Chemical Analysis Sugar(%)	pH	Total Acid
Table Grapes						
Interlaken	Sept. 22	31	8.96	19.9	3.0	0.76
Sov. Charter (1)	Sept. 22	17	45.79	16.5	2.9	0.45
Wine Grapes						
Auxerois	Sept. 22	22	13.05	16.8	2.99	0.57
Castel 19637	Oct. 20	27	9.85	29.1	3.13	1.07
Cayuga White (1)	Oct. 18	17	61.12	14.8	3.04	0.54
Ehrenfelser	Oct. 16	12	13.698	20.3	2.87	0.80
Gamay Noir	Oct. 20	13	13.3	22.1	3.10	0.94
Kerner	Oct. 16	23	13.5	21.0	2.96	0.70
Mad. Angevine	Sept. 22	18	22.35	17.9	2.85	0.67
Mad. Sylvaner	Sept. 9	27	12.53	19.0	3.75	0.5
N.Y. Muscat	Sept. 22	33	11.4	16.8	3.17	0.34
O.K. Riesling	Oct. 20	32	19.65	17.7	3.05	0.68
Ortega	Sept. 22	20	13.25	17.9	2.97	0.65
Rayon D'or	Oct. 20	26	17.97	20.2	2.83	0.91
Seyval Blanc	Oct 17.	31	35.87	17.6	2.81	0.86
Siegerrebe	Sept. 9	14	10.11	15.9	3.20	0.55
Sov. Ruby	Sept. 23	18	30.95	15.3	2.89	0.56

(1) Every second vine removed due to crowding.

Note:

Varieties removed in the Spring of 1987 were:

Pearl of Csaba	Precose de Malinger	NY21572	Festivee
Schonburger	Gutedelweiss	Reliance	Sov. Coronation
Vidal 256	Aurora	Suffolk Red	Sov. Jubilee
Weissburgunder	Chardonnay	Venus	Sov. Tiaira
			Sov. Gold

Varieties added were:

Optima	Khulman 482-2	Ravat 34	Horizon
Bacchus	Tormur	Seyve Villard 5247	Summerland 434
Pinot Gris	Perle	Summerland 495	Seyve Villard 23512
Perlette	Century I	Early Muscat	Pollux
Loose Perlette	Vineland 65051	Summerland 16	
Fiesta	Ruby Seedless	Summerland 239	

IMPROVED MARKETABILITY OF B.C. LETTUCE

Project No.: 238

Supervision: W.J. Odermatt, Regional Fresh Vegetable Specialist, R.E.S. South Coastal

Co-operators: Sophia Verzosa, Project Employee; Harvie Snow, Regional Extension Service, Messrs. Rush and Cloverdale Lettuce and Vegetable Growers' Co-operative; Pacific Vegetable Farm; Cloverdale Produce Farm; Dun Kin Farm; Sprangers Farm; H. Wong Farm; Brar Bros. Farm and J. Yue Farm

Branches: Regional Extension Service, South Coastal

Funding:

D.A.T.E.	1986-87	$5,000
D.A.T.E.	1987-88	$5,000
Cloverdale Lettuce and Vegetable Co-op		
	1986-87	$5,000
	1987-88	$5,000

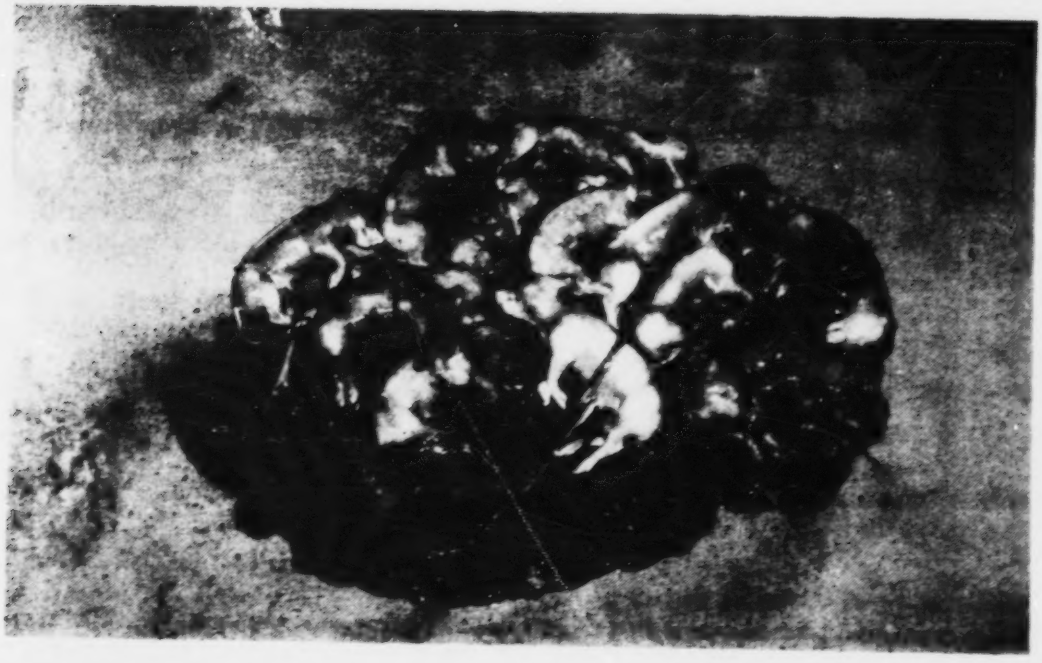
Objectives: To improve the marketability of B.C. lettuce by:
a) identifying crisphead lettuce varieties with better keeping qualities than the current industry standard, Ithaca;
b) identifying factors that may be contributing to shorter shelf life.

Summary: Twenty crisphead lettuce varieties were evaluated for yield, susceptibility to disease and physiological disorders, early seedling vigour and emergence, maturation time, and storage quality. The variety trials took place on seven farms in the Cloverdale area and duplicate plots were planted each month from April to July.

Lettuce was harvested as it matured, then packed, labelled, and taken to the Cloverdale Lettuce and Vegetable Growers' Co-op for vacuum cooling and cold storage. Stored lettuce was then evaluated over a 21 day period for development of post-harvest defects and rated for marketability and incidence of defects. Harvest and storage trials took place from later June to mid-October.

Evaluation of the collected harvest and storage trial data resulted in identifying several varieties suitable for larger scale trial for the following growing season. Based on this year's results, these varieties are recommended for their strong performance in the field as well as in storage: Salinas, Green Lake, Amaral, Kelvin, and Zodiac. Performance of these varieties is strongly affected by other factors such as fertility and packing practices, and it is recommended that these be incorporated in the following year of this project.

LEPTOSPIRA BRATISLAVA VACCINATION FIELD TRIAL IN SWINE



Aborted Feti

Project Number:	240 Disease Control - Swine
Supervision:	Dr. Neil Palechek, Abbotsford Veterinary Laboratory
Project Staff:	Dr. Chris Byra, Greenbelt Veterinary Services Ltd., Chilliwack; Dr. Len Lazzarotto, Shuswap Veterinary Clinic, Salmon Arm; Dr. Pam Gale, Animal Disease Research Institute, Lethbridge, Alberta
Co-operators:	Commercial swine producers: Lansdowne Stock Farms Ltd., Okanagan/Kootenay Region; Gentry Farms, Okanagan/Kootenay Region; Danfre Farms, Fraser Valley; Eric Haan, Fraser Valley
Branch:	Veterinary Branch
Funding:	D.A.T.E. 1987-88 $9,400

Objectives:

1) To determine if evidence of Leptospira bratislava infection in pigs is positively associated with observed infertility on problem farms.

2) To determine if new experimental vaccines protect against the observed infertility.

3) To determine if use of the experimental vaccines provides measurable benefit over cost of vaccination.

Summary:

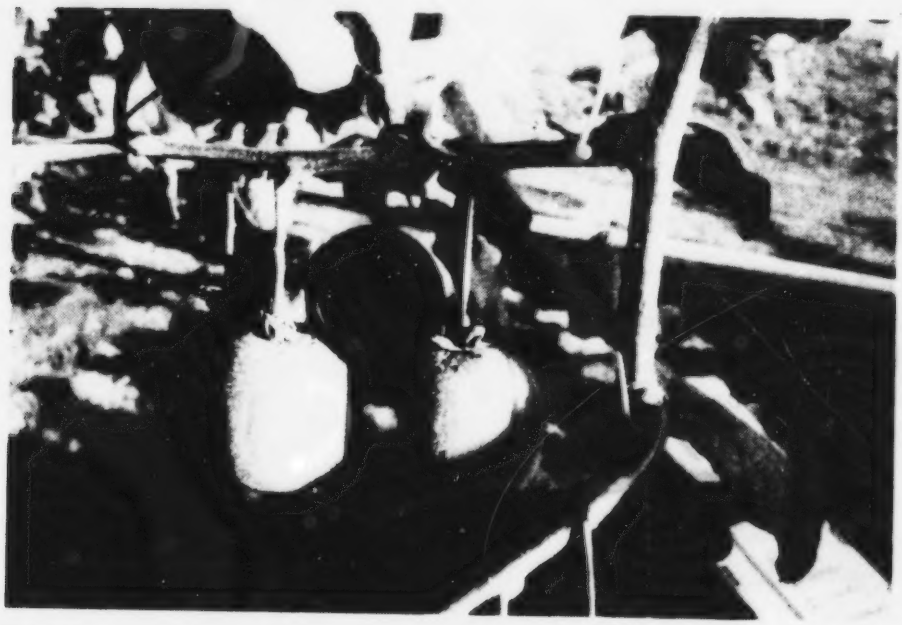
Some swine producers in British Columbia have experienced costly infertility problems as measured by farrowing rates as low as 60%, sporadic abortions and an unacceptable level of sow mortalities. Private veterinary practitioners have demonstrated positive serologic and fluorescent antibody tests that implicated Leptospira bratislava as the causative agent.

A new experimental vaccine has been developed to combat the described reproductive loss. Federal authorities granted permission to bring this experimental vaccine into Canada to conduct this field test. A second monovalent L. bratislava vaccine used in the trial was prepared by the Animal Disease Research Institute (ADRI) at Lethbridge, Alberta.

The vaccine trial was designed in two parts. In Phase I, blood samples were collected from 10% of 1,000 sows from four different herds in order to document prior exposure to L. Bratislava infection. Herds were divided into four groups so that animals with similar serologic profiles were included in each test group. Blood samples collected after the first and second vaccinations confirmed that both experimental vaccines successfully stimulated measurable humoral immunity in the pigs.

With the successful completion of Phase I, reproductive data was gathered for Phase II of the trial. Results of this data analysis will be economically beneficial to the swine industry regardless of the result. If it supports the use of these experimental vaccines, B.C. swine producers will have the first opportunity to benefit. On the other hand, negative findings would save the farmer the needless expense of vaccine purchase and labour costs over many years before coming to the same conclusion.

KIWIFRUIT POLLINATION STUDIES



Well pollinated Hayward fruit from pollination experiment

Project Number: 242

Supervision: B. Warner, Horticulturist, Sidney

Co-operators: D.M. McCutcheon, Apiculture Program Supervisor, Abbotsford; Steve Mitchell, Van Isle Apiaries; Ronny Quay, Agriculture Canada; Nick Pyke, D.S.I.R. New Zealand; George Doney and Ian Vantreight (co-operating farmers), Vancouver Island

Branches: Regional Extension Services, South Coastal, Apiculture, Abbotsford

Funding: D.A.T.E. 1987-88 $3,500

Objectives: To study kiwifruit pollination in relation to bee hive placement and distance from male vines in the orchard.

Summary:

In order to produce a marketable kiwifruit, the flowers must be well pollinated. This involves numerous individual flower visits by honey bees covered in male pollen. Many factors influence the success of this pollination and the two main factors studied in this case was the distance from the beehive and the distance from male vines.

Fruit were marked prior to bloom based on those two parameters and the development measured throughout the growing season. After harvest, the fruit was weighed, crushed and the seeds removed. These seeds were then counted.

It has already been documented that fruit weight corresponds almost directly to fruit seed numbers. By correlating distance from hives and male plants, it is hoped to document the optimum numbers of male plants and beehives to be utilized in commercial plantings in British Columbia.

APPLE SCAB CONTROL

Counting scab spores to calculate the level of fungicide resistance

Project Number: 243

Supervision: John Yorston, Plant Pathologist, Kelowna

Project Staff: Delia Warnock

Co-operators: Peter Sholberg, Plant Pathologist, Agriculture Canada, Summerland

Branch: Crop Protection

Funding: D.A.T.E. 1987-88 $5,150

Objectives: To identify the distribution of apple scab resistance to the commonly used fungicides, benomyl and dodine, in British Columbia.

Summary:

Apple scab, a major disease of apples, causes skin blemishes on the fruit resulting in high cullage rates. Scab has been controlled in the B.C. interior by using eradicant sprays applied after a period of wet weather. The two chemicals used for this purpose are dodine (Cyprex, Equal) and benomyl (Benlate). In 1986, there was a breakdown of control in some Vernon orchards where these chemicals had been used. Resistance to benomyl was identified as the cause. In addition, low levels of resistance to dodine were identified at a few sites.

This project permitted a more extensive survey in the summer of 1987. 191 leaf and fruit samples were submitted from most apple growing areas of B.C. The majority of samples came from the northern half of the Okanagan with a few samples from the Kootenays, Vancouver Island and the area south of Kelowna.

Of the 191 samples collected, 147 had spore counts high enough to test. Dodine (Cyprex, Equal) resistance at 2.0 ppm was found in 34 percent of the samples. Another 14 percent had resistance to benomyl (Benlate) at 1.0 ppm. In a few cases resistance to both fungicides occurred in the same orchard.

The information gathered was useful for participating growers, horticulturists and fieldmen. Changes in growers spray programs were implemented immediately when resistance was found. The packing houses report very little economic damage to fruit in 1987 even though leaf scab was common in many orchards. Another example of the economic benefits of resistance testing was the good control of apple scab in the Bella Vista area of Vernon. In 1986 the Vernon Fruit Union showed an average cullage rate due to scab in these orchards of 21% or a $72,000 loss. In 1987 the growers changed to a protectant spray program by alternating several different fungicides. Their scab control was so good that no scab could be found for further testing in 1987.

Most growers in scab prone areas have now switched to a spray program using several different types of spray chemicals. This should reduce fungicide resistance and subsequently reduce scab losses.

COW/CALF MANAGEMENT SYSTEMS FOR IMPROVED PRODUCTIVITY

Co-operators Ann, Ralf and Ulla Hogberg Weighing Calves at Weaning

Project Number: 244

Supervision: Kathy Sandy, District Agriculturist/Livestock
Dawson Creek

Co-operators: Ralf and Glenn Hogberg, Beef Producers, Progress, B.C.

Branches: R.E.S. Central/Peace

Funding: D.A.T.E. 1987/88 $4,400
D.A.T.E. 1988/89 $ 400

Objectives: To demonstrate the potential for improved productivity through such management practices as shortening the calving season, performance testing and early weaning.

Summary: A Paul portable mechanical livestock scale was purchased and was assembled by the co-operators.

One ranching family participated in this program during its initial year. Their major objective is to increase weaning weights by shortening the calving season to 42 days. They also wanted to use performance indexes as a

criteria in selecting heifers. Finally, they wanted to measure the shrink that occurred during the marketing of their calves.

Calving records from the spring of 1987 were examined to use as a base to measure improvement. The calving period ran from February 28 to May 19, or 81 days. Of 96 cows, 58 calved during the first 21 days, 30 during the next 21 days, 6 during the 3rd 21 days, and 2 after that. Feed testing was carried out and rations formulated to ensure adequate cow nutrient intake.

The calves were weighed at weaning (October 12) and performance indexes evaluated using Alberta Agriculture's R.O.P. sofware. Average weaning weight was 593 lbs, with average adjusted 200 day weight 590 lb. This year, heifers had been largely preselected for replacement due to the use of a particular A.I. bull in the spring of 1986.

It is difficult to get a true picture of shrink, as there is always stress involved in the weighing procedure. Calves were weighed on the morning of October 12 and then turned back with the cows. Early on October 13 they were separated, loaded and hauled to High River, approximately 600 miles. They were put on feed and water at the auction mart and sold the following evening. Shrink was 6.8% in this instance.

In 1988/89 the current co-operators will continue with their project and several other ranchers in the North and South Peace will initiate projects. In addition, a number of "BC Beef Producer Program" record books have been distributed and producers will be encouraged to return these records for analysis.

THE VANCOUVER ISLAND DIRECT MARKETING ASSOCIATIONS

Direct Farm Marketing Booth at Food Fair held at Tillicum Mall, manned by Doug O'Brien

Project Number: 245

Supervision: B. Warner, Horticulturist, Sidney

Co-operators: Saanich Peninsula, Mid Island and North Island Direct Marketing Associations

Branches: Regional Extension Services, South Coastal

Funding: D.A.T.E. 1987-88 $4,000

Objectives: To set up three marketing associations on the Island to assist local producers in selling their products directly to the consumer.

Summary: Three distinct growers associations were formed on the Island representing approximately 50 farms. The associations printed and distributed marketing brochures which listed seasonal availability, as well as location of individual producers. Other activities included setting up and staffing displays at various fall fairs and food shows. Flyers in all areas were distributed by hand. The Saanich Peninsula Association printed and distributed 40,000 flyers and will likely produce 100,000 flyers in 1988. All farmers surveyed at the end of 1987 agreed it had been a worthwhile venture and were looking to an even larger market in the coming season.

IMPROVED POTATO QUALITY AND PRODUCTION EFFICIENCY

Collecting harvest yield data from a potato demonstration plot.

Project Number: 246

Supervision: Marney James, P.Ag., Provincial Vegetable Specialist, Cloverdale

Co-operators: Bill van Lierop, Soil, Feed and Tissue Testing Laboratory Supervisor; Jim Harris, Commercial Grower, Delta; George Wright, Commercial Grower, Richmond

Project Staff: Paul Ouellette, Potato Technician, Cloverdale

Branches: Regional Extension Services, South Coastal

Funding: D.A.T.E. 1987-88 $5,500
D.A.T.E. 1988-89 $2,000

Objectives: To develop a nitrogen fertilizer program for potatoes that maximizes production and quality while at the same time maximizing fertilizer efficiency and grower profitability.

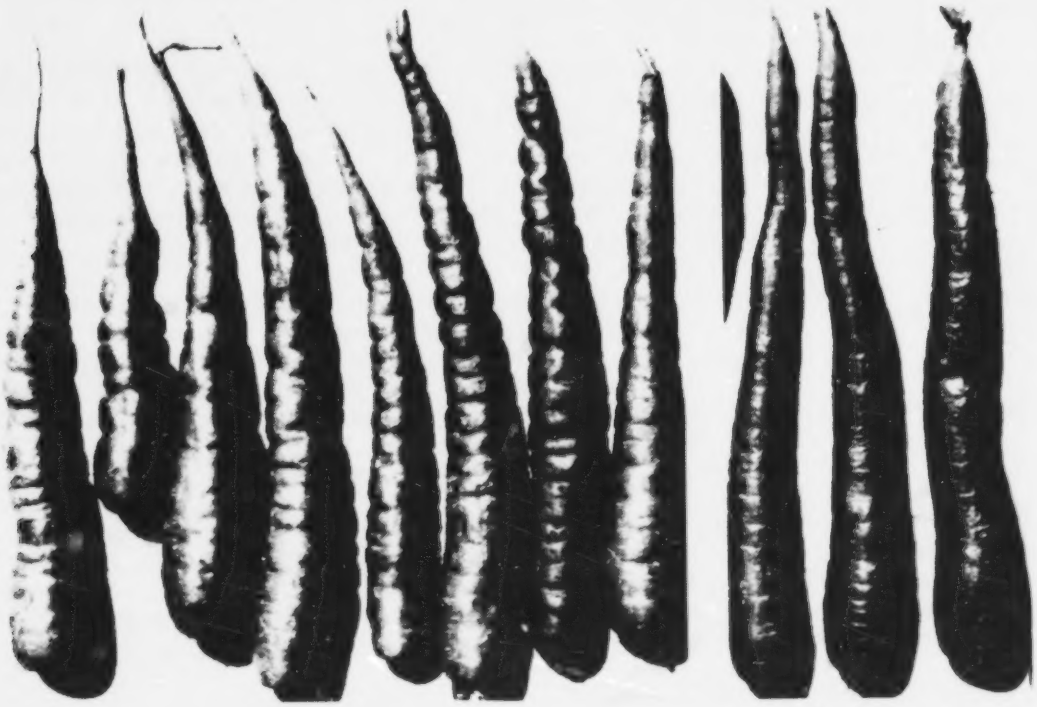
Summary: In accordance with the industry goal of improving quality and profitability to the potato industry a nitrogen fertilizer program developed in Idaho was demonstrated and compared against traditional grower practices and recommendations of the BCMAF Soils Laboratory in two Lower Fraser Valley locations.

The Idaho program is unique in that it proposes reduced preplant nitrogen applications followed by biweekly petiole analyses which monitor crop nitrogen levels required. This program claims earlier initiation of tubers hence longer bulking periods and greater production per unit area. It further claims superior tuber quality and increased fertilizer efficiency.

The program allows growers to monitor nitrogen levels in the potato crop at all stages of development and supplement these levels only when the model and/or experience indicates that it is necessary.

Yield data, crop quality, harvest dates and fertilizer usage will be measured and evaluated on each of the treatments for two years to determine if the Idaho program is suitable for the B.C. industry and if it does produce a superior crop in terms of quality and production.

IMPROVED MARKETABILITY OF CARROTS



Carrots exhibiting light ribbing (L) and heavy ribbing (R)

Project Number: 247

Supervision: David J. Ormrod, Plant Pathologist, Surrey

Project Staff: Rosa Van Meel, project employee with the B.C. Coast Vegetable Co-Operative

Co-operators: R.J. Copeman, Department of Plant Science, University of B.C.; R. Gilmour, B.C. Coast Vegetable Co-Op, Richmond; and the following carrot growers: G. Cowland, F. Hildebrandt, L. Law, K. Maddocks, G. Sprangers, A. Stetar, P. Warmerdam and B. Wisbey

Branch: Crop Protection

Funding: D.A.T.E. 1987-88 $4,000
B.C. Coast Vegetable Co-Op 1987-88 $2,984

Objectives: Most of the British Columbia carrot crop is grown in the Lower Fraser Valley. Physical disorders such as poor shape, poor colour, cavity spot, and black root rot have

frequently reduced the marketability of the crop resulting in lost sales and increased levels of imported carrots. Some of these problems have been studied in past D.A.T.E. projects.

Recently, carrots grown on the organic soils of Cloverdale have shown an increasing incidence of ribbing which gives them an unacceptable appearance and makes them more difficult to wash. One of the main objectives of this project was to make observations on factors influencing ribbing with a view to developing control or avoidance strategies.

Summary: A survey involving 35 fields in the Cloverdale and Sumas areas was carried out between May and August, 1987. Ten carrots from each of ten randomly selected locations in each field were pulled at 70, 90 and 115 days after seeding. These were rated from 1 = slight ribbing to 4 = very heavy ribbing based on samples collected previously at the Co-Op grading line.

1) Soil - All fields showed some ribbing but the sandy Sumas soils had by far the least. Next lowest incidence was in the deep, organic soils at Cloverdale. Organic soils with evidence of mineral ridges were next and fields with mixed organic and clay had the most ribbed carrots.

2. Time of sowing - Contrary to suggestions from the literature, the earliest sowings had the least ribbing but this is believed to be a reflection more of soil type than timing. The deepest organic fields tended to be the best drained and were thus seeded earlier than the more degraded soils.

3. Cultivar - Differences between cultivars were not consistent across all soil types. To determine if there is a significant cultivar by soil interaction, the survey should be repeated in 1988. All cultivars grown on sandy and deep organic soils produced acceptable crops with little ribbing. On the more ribbing prone mixed soils, Hi Pak, Chrisna and Top Pak tended to be the smoothest.

Ribbing does not appear to be a significant problem on sandy or deep organic soils. Growers with mixed organic/clay soils should consider selecting less sensitive crops, using more green manure to maintain organic matter levels, and growing cultivars which are less susceptible to ribbing. The survey should be repeated in 1988 to observe as many cultivars as possible on the ribbing-prone soils and also gather more information on irrigation scheduling to see if that is a factor.

EXTENSION OF THE STRAWBERRY SEASON

Project Number: 248

Supervision: Brent Warner, Horticulturist, Sidney

Co-operators: Dr. Hugh Daubeny, Agriculture Canada, Vancouver; Doug O'Brien, Technician, Sidney; Rod Chilton, Contract Technician, Sidney

Branch: Regional Extension Services, South Coastal

Funding: D.A.T.E. 1987-88 $2,000

Objectives: To demonstrate the suitability of the newest day neutral strawberry varieties to strawberry producers on Vancouver Island.

Summary: All strawberries grown on Vancouver Island are marketed directly to the consumer as fresh product. In order to extend the season, a demonstration planting of day neutral everbearing varieties was established at the Agriculture Canada, Saanichton Quarantine Station.

Varieties tested were Tristar, Tribute, Selva, Quinault, Fern and Hecker. The highest yielders were Tribute and Tristar, followed by Hecker and Fern. Selva and Quinault were the lowest yields. The fruit quality of Tristar was far superior to any of the other selections. Due to the exceptionally long summer, harvesting continued until the 15th of November.

STUDY TOUR TO ENHANCE PRODUCTION AND PROTECTION TECHNIQUES OF AMERICAN GINSENG (Panax quinquefolium) AS A NEW CROP IN B.C.

Damping-off is caused by certain fungi in the soil which infect and destroy ginseng roots. Young seedlings wither and die

Project Number: 249

Supervision: A.J. Buonassisi, Plant Pathologist, Cloverdale; and A. Oliver, Regional Horticulturist, Kamloops

Co-operators: J. Parke, Plant Pathologist, University of Wisconsin; C. Hunter, Plant Pathologist, Ontario Ministry of Agriculture and Fisheries; Volhard Aero Inc., Marathon, Wisconsin; HSU's Ginseng Enterprizes, Inc., Wausau, Wisconsin

Branches: Regional Extension Services - Thompson-Cariboo Region
Crop Protection Branch - South Coastal Region

Funding: D.A.T.E. 1987-88 $2,175

Objectives: To assist in the development of B.C.'s new ginseng industry by establishing contacts with Wisconsin and Ontario concerning pests and crop protection techniques.

Summary:

Ginseng disease prevention and control was the focus of a study tour to Wisconsin and Ontario, June 29 - July 3, 1987. The study tour allowed the opportunity to view severe disease outbreaks in north central Wisconsin and southern Ontario, and obtain critical pest control information from growers, researchers and extension workers.

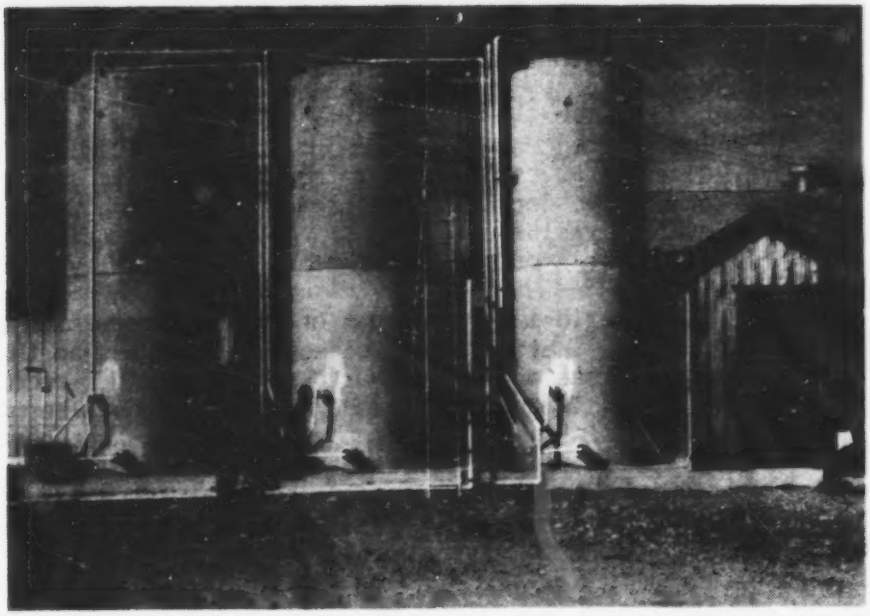
The high value of ginseng and its susceptibility to diseases makes disease control an essential management practice. Outstanding ginseng yields of 3,500 lb/a to average yields of 2,000 lb/a can be drastically reduced to 900 lb/a or the crop entirely destroyed by diseases.

B.C.'s arid interior areas of ginseng production are much less favourable to disease outbreaks than the wet, humid areas of eastern North America. Older records of ginseng diseases occurring in B.C. include Alternaria panax (leaf spot), Meliodogyne sp. (root-knot nematode), Ramularia destructans (root rot) and Rhizoctonia solani (stem rot). Phytophthora cactorum which causes leaf blight and root rot of ginseng has not been reported in B.C. but this fungus does exist naturally in B.C. soils.

Reports of ginseng diseases occurring in B.C. this year include: Alternaria leaf blight on woods grown ginseng from the Kootenays and damping-off, a widespread problem in most ginseng gardens. Damping-off is caused by a number of soil fungi that either rot the seed in the soil or kill the seedling after it has emerged from the soil.

The disease prevention and control program is being specially designed for B.C. ginseng growers based on the information collected during the study tour. The program involves seed treatment with a fungicide followed by regular crop monitoring and application of fungicidal sprays to protect the foliage. Ginseng disease outbreaks occurring elsewhere in the world can be avoided in B.C. right from the start by following a disease prevention program. A special series of Pest Control Notes outlining the disease prevention program will be available to growers.

SEQUENCING BATCH REACTOR FOR TREATING DILUTE SWINE MANURE



Completed 3-stage Sequencing Batch Reactor plant at Peter Hill Swine Farms. Electrical and control shed is at right

Project Number: 250

Supervisor: Rich van Kleeck, P. Eng., Waste Management Engineer, Engineering Branch, Abbotsford

Co-operators: Dr. Victor Lo, P. Eng., Department of Bio-Resource Engineering, U.B.C.
Mr. Peter Hill, pork producer, Langley, B.C.

Branches: Engineering

Funding: D.A.T.E. 1987-88 $6,000
Dept. of Bio-Resource Engineering -
Design and laboratory services $1,000
Peter Hill Holdings Ltd. -
Construction, equipment, supplies $7,500

Objectives: A Sequencing Batch Reactor (SBR) is a waste water treatment system that is a high rate aeration process that affords a relatively low cost and highly effective stabilization of the waste. The technology has proven to be effective in pilot-plant demonstrations at the UBC

The objectives in this phase of SBR research is to treat swine waste effluent using a three-stage SBR treatment process so that the treated effluent is sufficiently stabilized to discharge (under Waste Management Branch permit). Livestock producers in B.C. require advanced waste treatment technology since land area available for safe land-spreading of manures is scarce. Waste treatment methods to reduce the pollution potential of manure disposal is urgently required.

Summary:

Based on previous experimental work carried out by Dr. Victor Lo and the operational parameters of the Peter Hill swine farm, a design for a 3-stage SBR system was developed in the spring of 1987. The system called for extracting effluent from aerated and gravity settled swine waste from the farm's existing aerated collection tank.

The effluent is loaded into the top of the first reactor stage and aerated at high rate for 2 1/2 hours. This is followed by a gravity settling stage of 1 hour after which the settled sludge is pumped to sludge storage and the treated effluent is transferred to the second reactor stage where the process is repeated.

The system handles 2,600 Imp. gal/day and the BOD reduction is expected to be in excess of 95%. BOD, biological oxygen demand, is a key measure of the pollution potential of waste water.

The system was constructed in the summer and the testing and operational phase continued throughout the fall and winter.

There are 5 float switches to control levels in the reactors, 1 aerator, and 2 transfer pumps in each of the 3 reactors. To control the system, a General Electric, Series One Junior programmable industrial process controller was installed. This small unit successfully controls 7 input channels and 11 output devices of the total SBR system at Peter Hill's Farm. It would not be possible to operate such a complex treatment plant economically without the use of such a controller.

This farm-scale, SBR system has operated so successfully in it's first months of operation that a more extensive research project has been designed to be funded under the ARDSA program.

BEEF HERD EXTENSION IN THE CENTRAL INTERIOR

Project Number: 251

Supervisor: Robert Kohlert, Regional Director, North Central Region, Prince George

Co-operators: Beef farmers in the Prince George, Vanderhoof and Quesnel area

Branches: Regional Extension Services, North Central Region

Funding: D.A.T.E. 1987-88 $3,000

Objectives: To provide the means by which the District Agriculturists could encourage the use of detailed records on beef herds to improve production profitability. Equipment purchased through this project will be used for on-farm demonstrations where operators do not have the necessary equipment.

Summary: The equipment delivery was delayed to the point where use could not be made in 1988 but plans are to utilize in 1989.

Farmers have been contacted and plans are underway to demonstrate how visual estimates and actual weights compare in calf selections. Plans are also established to hold a training session on her sire selection in the fall of 1989.

DEMONSTRATION USING AN EXCAROTOR FOR DRAINAGE DITCH CONSTRUCTION AND MAINTENANCE

Excarotor cleaning a drainage ditch

Project Number: 252

Supervision: T.W. Van der Gulik, P. Eng., Agricultural Engineer, Abbotsford

Project Staff: Fraser Smith, Engineer, Abbotsford; Roger Bryant, Technician, Abbotsford

Co-operators: Barry Griffiths, Griffiths Dragline Services, Abbotsford

Branch: Engineering

Funding: D.A.T.E. 1987-88 $6,500

Objectives:

An excarotor has numerous advantages over conventional ditch cleaning and construction equipment. The objective of this project is to demonstrate these benefits to farmers in the Fraser Valley. The benefits that can be obtained by using an excarotor include:

- increased travel speed which will lower the cost per foot. The increased speed and lower cost may allow drainage ditches to be cleaned more often.

- construction of ditches with uniform side slopes.

- allowing side slopes to remain intact by cleaning the bottom of the ditch only. This will hopefully reduce sloughing and degradation of the ditch side slope.

- new ditches can be constructed quickly without a windrow.

Summary:

A P.T.O. driven unit will be demonstrated in the Fraser Valley early in 1988. A 100 h.p. tractor will be used to transport and power the unit. At the present time the contractor is firming commitments for 16 km of ditch cleaning to cover the cost of importing and demonstrating the unit.

It is expected that this machine will be able to clean ditches at a speed of 1.5 km/hr. New ditches can be constructed at speeds ranging from 0.5 to 1.5 km/hr depending on ground condition and depth of cut. The material excavated can be spread or windrowed, in one equipment pass. Ditch cleaning cycle may also be improved from 7 to 10 years to 3 to 5 years. These results will mean better drainage and irrigation conditions for much of the low lands in the Fraser Valley.

Plans are also underway to test this equipment in B.C.'s wetland meadow area. If successful, demonstrations will be held in the B.C. Cariboo Region. Demonstrations are being planned for various locations of the Fraser Valley in 1988.

GRAIN SWATHER FLOATATION

Swather Floatation Tracks Demonstrated as Local Farmers Look On

Project Number: 253

Supervision: Murray Tenove, Agriculture Engineer, Dawson Creek; Jack Dobb, Provincial Specialist, Dawson Creek

Co-operators: Frank Breault, Farmer, Dawson Creek; Jay & Gerry Hill, Farmers, Baldonnel

Branches: Engineering
Field & Special Crops

Funding: D.A.T.E. 1987-88 $8,400

Objectives: To evaluate two commercially available floatation systems for use on grain swathers during wet weather and extremely soft soil conditions in the Peace River region. Equipment evaluated included crawler type half tracks and wide floatation tires.

Summary:

Both types of equipment had the opportunity to work under regular grain harvesting operations this fall. The track system, mounted on a John Deere 2420, performed exceptionally well on very wet, waterlogged fields. Its traction and floatation capabilities appeared to be limited only by the amount of torque the swather drive train could transfer to them.

The special floatation tires, when mounted on a Massey Ferguson 885, performed only marginally during limited testing and had a tendency to bog down.

Ongoing media coverage and a field demonstration day were carried out to expose local farmers and farm machinery dealers to the equipment. A questionnaire was distributed to determine what they thought of the equipment.

Videotape footage of the modified John Deere swather was taken as well as soil moisture tests to be used in evaluating and comparing future test results. This is available to farmers to view who were not able to attend the field demonstrations.

If a similar harvesting dilemma presents itself next year, floatation and traction evaluations on other equipment and field conditions will be carried out.

WATER CONSUMPTION OF BEEF CATTLE ON RANGE

Beef cattle use water at different rates spring to winter

Project Number: 254

Supervision: Lance Brown, A.Sc.T., Agricultural Engineering Technologist, Kamloops

Co-operators: John Schalles, Schalles Ranch, Ashcroft

Branch: Engineering

Funding: D.A.T.E. 1987-88 $500
D.A.T.E. 1988-89 $100

Objectives: To determine daily water consumption by beef cattle grazing on spring and late fall/winter range.

Summary:

Developing cattle watering systems on range requires a water use rate. Estimates are presently used which vary from 7 gpd to 15 gpd. By past observations there is also an apparent difference between spring and fall.

When sizing a water supply system, especially if power is required for pumping or if storage is to be used, a daily use rate would be very useful.

The funding for this project in this first year has been used to purchase and install an accumulating flowmeter in a livestock water pumping system. The site is a range demonstration site near Cache Creek, B.C. in which other related range development projects are centered (see Project Nos. 190 and 210, D.A.T.E. Report 1985). The meter was installed on 20 October 1987 and is measuring pump flows during the late fall/winter grazing period. The co-operator, John Schalles, will record pumped flows each time the pump system is operated. Data will also be collected for the spring grazing period. Two or three years will be required to determine the average daily consumption rates.

Project Number: 255 - South Coastal Region

Supervision: W.E.A. Wickens, P.Ag., Regional Director, Abbotsford

Co-operators: Peter Fofonoff, P.Ag., District Agriculturist, Duncan; Ruth deCrom, Horticulture Technician, Agriculture and Food Center; Ron Charles, P.Ag., District Agriculturist, Abbotsford; Marney James, P.Ag., Provincial Vegetable Specialist, Cloverdale; Malaspina College, Nanaimo

Funding: D.A.T.E. 1987/88 $5,000

Objectives: To enhance the capability of district staff to demonstrate new technology, soil management techniques, new computer software suitable for extension work and opportunities for small farm holdings.

Summary: The South Coastal D.A.T.E. 255 allocation was utilized in the Fraser Valley and on Vancouver Island for several smaller projects which were supportive of R.E.S. staff activities. These funds are most useful because of the flexibility and local administration of the funding process. Staff initiated a number of projects in their districts in co-operation with local producers and regional colleges.

Detailed soil information was mapped in the Duncan-Nanaimo area and on-site references on soil characteristics, suitability and management erected. Soil information included parent material, topography, texture, drainage as well as comments on land use suitability. The information developed and provided will improve land use planning, assessment and management in the area.

With the acquisition of MacIntosh computers for district staff use, a number of computer software programs, support equipment and training sessions were purchased. This was done to evaluate the applicability of the software packages to the extension process. Software included microsoft works for developing clientele files and records and spreadsheet programs for farm management extension.

A small farm development course was developed and delivered in co-operation with Malaspina College. The course provided basic knowledge of farm business management, provided information on farm planning and development and identified opportunities for small scale farming operations.

Funding was provided for miscellaneous field trial work such as tansy ragwort control, fertility studies of potatoes and blueberries, silage corn nutrient requirements, black currant and gooseberry trials, etc. Many of these projects are ongoing and require funding for chemicals and small tools for maintenance and data gathering.

DEMONSTRATION OF AGRICULTURAL TECHNOLOGY IN
THE OKANAGAN/KOOTENAY REGION

Grape Leaf Pruning Equipment Observed in New Zealand

Project Number: 256

Supervision: Helmut Arndt, John Price, John Vielvoye

Co-operators: External Affairs Canada - Technology Inflow Program
John Corner, Apiary Consultant; Bruce Currie, Orchardist;
John Bambrough, Orchardist; Okanagan North Grower's
Co-operative

Branches: Regional Extension Services, Okanagan/Kootenay Region

Funding: D.A.T.E 1987-88 $5,000
Technology Inflow Programs - $3,500
Bruce Currie - $2,000
John Baumbrough - $2,000
Okanagan North Growers' Co-operative - $1,951.85

Objectives: To enhance the adaption of new technologies in the Okanagan/Kootenay Region by demonstrating new techniques and by observing and collecting relevant technology from outside the region.

Summary: The New Zealand grape industry has much to offer B.C. grape growers in the way of production and marketing innovations or alternatives. D.A.T.E. funds were used to partially support a study tour by John Vielvoye, Provincial Grape Specialist to observe new vineyard technology in mechanized vine leaf removal; advances in trellis design and vine training;; close vine spacing; limited pruning and minimal pruning; vineyard sprayers; use of artificial and natural windbreaks; vine training and harvesting equipment; vine improvement scheme; effects of grape phylloxera and benefits of grape rootstocks to overcome this pest; vineyard management techniques. Attention was also given to production of table grapes under glass and plastic structures for specialized markets.

Information collected is being made available to BCMAF staff at all levels, and to the industry in British Columbia. Plans to bring in and apply some of the new ideas and technology have already been made.

Alternatives to the heavy dependence on MacIntosh apply variety in the North Okanagan are being evaluated in a small demonstration project near Vernon. D.A.T.E. funds supported the initiation and establishment of this project in 1987 which includes six new cultivars, Empire, Gloster, Elstar, Gala, Sumac and Shamrock. Each will be evaluated for commercial potential in high density systems. Results will be available as these new plantings begin to bear fruit.

Pollenization is a critical aspect of fruit production. Placement of bee hives and sources of pollen for cross fertilization are techniques used to ensure pollenization can take place, however in some years, factors such as weather limit the natural opportunities for pollenization to occur. This project, supported by regional D.A.T.E. funds, involved the use of pollen inserts in the bee hives placed in the orchard to enhance the pollenization process to better ensure adequate pollenization.

Records after the first year of the experiment show a marked increase in production of Red Delicious after years of low cropping. The weather, during flowering in 1987 was warm with periods of rain and wind, however, the following resulted:

Bin Records

Year	Total Bins Harvested	
1982	379	
1983	505	
1984	82	- spring frost during bloom
1985	359	
1986	203	
1987	440	- pollen inserts used

To determine if pollen inserts are truly effective, this co-operative experiment will be carried out again in 1988 and 1989.

Project Number: 257 Central-Peace River Region

Supervision: Robert Kohlert, Regional Director, Central-Peace River; Kathy Sandy, District Agrologist, Livestock, Dawson Creek

Co-operators: Cattle producers in the Peace River area

Branches: Regional Extension Services, Peace River

Funding: D.A.T.E. 1987-88 $486

Objectives: To increase the awareness of forage quality and its role in livestock nutrition. This was to be accomplished by establishing a forage competition for producers in the Peace River, complete with speakers dealing with different aspects of animal nutrition.

Summary: The forage competition was a success, with 44 producers contributing 88 samples. Also, 55 producers attended the seminar day in spite of the winter's worst blizzard, and sub-zero temperatures.

Plans are underway for an enlarged competition to build on the experience gained from the competition in 1987-88.

ENHANCED FOX FARMING PRODUCTIVITY

Project Number: 258

Supervision: Graeme Johnston, District Agriculturist

Co-operators: Lakes District Foxbreeders at Arnold Faber's Farm;
Dr. Jan Faugner - The Norwegian Fur Breeders Association

Funding: D.A.T.E. 1987-88 $4,000

Objectives: Approximately 12 fox farmers from Central, Northern B.C. and the Fraser Valley brought a Norwegian expert to British Columbia to teach the techniques of artificial insemination in foxes. Natural breeding requires one to three males. Females do not necessarily accept males so efficiency drops.

Summary: It was a comprehensive study, covering preparation of animals, clinical and technical evaluations, collecting of semen and intrauterine insemination. It also covered genetics, animal medicine, pathology and some pharmacology. Along with the theoretical material there was extensive practice on live animals. Dr. Faugner proved to be an outstanding teacher and the participants gained a great deal from the clinic.